

**REMARKS**

Reconsideration of the application is respectfully requested in view of the following remarks.

An abstract is enclosed on a separate piece of paper.

The claimed invention as amended relates to a process for preparing a frozen food product comprising an antifreeze peptide wherein the process comprises a compaction step. The invention is also directed to a free flowing particulate food product comprising antifreeze protein obtainable by rapidly freezing the food product such that the food product reaches a temperature of -50C or lower within 30 seconds.

As discussed in the present specification (see page 1, lines 11-20 and page 2, lines 1-12), it is known from the art to add antifreeze peptides (AFPs) to frozen food products. Moreover, it is reported that addition of AFPs to frozen food products will control ice crystal growth and so give a smooth texture. However, aggregation of ice crystals have occurred in AFP containing frozen food product. Surprisingly, the presently claimed process results in the aggregation of ice crystals in AFP containing frozen food products being minimized, thereby providing more favorable textures, even after prolonged storage. It provides a solution to the problem of providing an antifreeze peptide containing frozen food product having desirably small ice crystals which do not aggregate (and hence which has a more favorable texture),

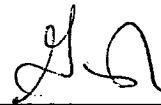
Clemmings is concerned with the production of ice cream comprising AFPs, but the Office points to no disclosure or suggestion of a compaction step or that rapid freezing should be effected.

Regarding the obviousness objection over GB 2328136, although this reference may disclose that the application of specific forces to AFP containing products during or after the freezing process can lead to less aggregation of ice crystals in the product, these forces are either repetitive (as in the form of vibrations) or involve a sudden, concentrated application of force (as in an hydraulic shock). The Office points to no suggestion of the presently claimed solution of applying a constant pressure using a screw extruder, even though this would be technically much less complicated to achieve. Although the Office contends that this solution was obvious, it points to no teaching of same in the cited reference. Also, although the reference indicates that the time period for applying vibrations depends on the speed of freezing and that the period of vibrations will be from 1 second to 2 hours, it does not appear to teach that rapid freezing should be effected.

In view of the foregoing, it is respectfully requested that the application, as amended, be allowed.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version With Markings To Show Changes Made.**"

Respectfully submitted,



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

In the claims:

Please cancel without prejudice claims 1-6 and 14, amend claims 7-12 and add new claims 15-17 as follows:

7. (Amended) A process for the manufacture of a frozen food product comprising AFPs, wherein the process comprises ~~one or more of the following steps:~~

(iii) ~~a~~ an optional (pre-)rapid freezing step such that the product reaches a temperature of -5°C or lower within 30 seconds ~~which is a nucleation dominated freezing step; and~~

(iv) ~~a (post-)compaction step using a screw extruder or a compactor.~~

8. (Amended) A ~~The~~ process according to claim 7 wherein in step (i) the product is frozen to a temperature of -5°C or lower ~~within 30 seconds~~ in from 0.01 to 25 seconds.

9. (Amended) A ~~The~~ process according to claim 7 wherein in step (i) the product is frozen to a temperature of -5°C or lower in from 1 to 15 seconds.

10. (Amended) A process according to ~~any one of claims~~ claim 7 ~~to 9~~ wherein step (i) involves one or more of:

(f) surface freezing, ~~preferably film freezing,~~ onto a cold surface;

(g) freezing of a supercooled system;

(h) decompression freezing;

(i) freezing at very low temperatures;

(j) rapid particulate freezing, preferably condensation freezing.

11. (Amended) A process according to ~~any of claims~~ claim 7 to 10, wherein step (i) involves drum freezing of the product.

13. (Amended) A process according to claim ~~427~~, wherein in step (ii) the extrusion temperature of the frozen food product is less than  $-8^{\circ}\text{C}$ .

15. (New) A free-flowing, particulate food product comprising anti-freeze peptide, which maintains its free-flowing nature during storage, obtainable by rapidly freezing the food product such that the food product reaches a temperature of  $-5^{\circ}\text{C}$  or lower within 30 seconds.

16. (New) The free-flowing, particulate food product according to claim 15, wherein the food product is rapidly frozen such that the food product reaches a temperature of  $-5^{\circ}\text{C}$  or lower in from 0.01 to 25 seconds.

17. (New) The free-flowing, particulate food product according to claim 8, wherein the food product is rapidly frozen such that the food product reaches a temperature of  $-5^{\circ}\text{C}$  or lower in from 1 to 15 seconds.